

# BULLETIN

OF THE

## CHICAGO ACADEMY OF SCIENCES

A NEW PSELAPHID BEETLE FROM BRAZIL  
ASSOCIATED WITH TERMITES

BY

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At the present time, there are 358 species of Pselaphidae known to inhabit Brazil. Previously, none were known to inhabit the nests of termites in this country. The following new species was sent with its termite host to Professor Alfred Emerson of the University of Chicago by Mr. R. L. Araujo of the Biological Institute of São Paulo. This interesting pselaphid was transmitted to me for identification and its description follows.

**Hamotocellus araujoi new species**

*Type* 2.6 mm. long by 0.87 mm. wide. Integument shining, light reddish-brown. Pubescence shining, golden, subappressed and normally aciculate throughout setae very minute on palpi, short on head, twice as long on pronotum, four times as long on elytra, and twice as long on abdomen as the cephalic pubescence; pubescent pattern of dorsal surface as illustrated (Pl. I, 1). Head indistinctly punctulate, pronotum punctate, and elytra more coarsely punctured; antennal acetabulae, cervical and discal elytral impressions glabrous.

Head with a pair of flattened, finely-faceted, reniform eyes four-fifths as long as tempora. Tempora slightly oblique, continued anteriorly as a flat, inconspicuous genal canthus into the concave posterior ocular margin. Occiput medianly slightly indented. Vertex flat, with a pair of vertexal foveae between the eyes; each vertexal fovea appearing as a darkened, circular area in the center of which is a minute pore. Just posterior and mesiad of these vertexal foveae is a pair of rudimentary foveal impressions. Front slightly narrower than vertex, simple,

almost truncate, with no median antennal tubercle, an antenna inserted beneath each apical angle; front simply declivous beyond interantennal line, becoming narrowed sixty per cent between the broad antennal acetabulae beneath the truncate frontal roof, and then gradually less declivous and broadening into the simple clypeus. Labrum simple. Mandibles with base of rami externally tumid.

Maxillary palpi typically hamotine, four-segmented, with segmental proportions and shapes as illustrated (P1. I, 3, 4). The fourth (distal) segment is large, longer than second, subfusiform, entirely sulcate on the internal (mesial) face, with a palpal cone set obliquely within the sulcus at its origin near the apex.

Antennae eleven-segmented, very distant from each other from a dorsal view as a consequence of the complete absence of a median antennal tubercle. Segment I elongate; II to IX transverse from a dorsal view, II to X transverse from a mesial view, with IV to VIII transverse moniliform. Club of last three segments, segment XI as long as the preceding three united, coarsely punctate, oviform dorsally, abnormal from a mesial view because of a distinct cuspid tooth at base of ventral face.

Pronotum slightly wider than head, widest at apical five-sixths, sides slightly oblique to straight basal bead, disc slightly gibbous; basal sixth, below gibbous disc, depressed, with a large, shallow, nude fovea at center; each flank has a long, oblique, sulcoid impression but without lateral fovea; these sulcoid impressions become evanescent on the depressed dorsal surface of the base, and are traced with difficulty to the median fovea. This pronotal pattern is difficult to analyze. Under low magnification there is no transverse impression, and the pronotum appears to have two oblique lateral impressions and a median fovea. Under high magnification, the median fovea is connected with the oblique grooves by a just discernible indenture and the lateral foveae are absent as such. Such a condition is very different from the genotype, *hirsutus* Raffray, and is best compared with species of Group XI *Hamotus*. However, these latter species all have well formed lateral pronotal foveae.

Elytra united wider than long, individually one-third longer than wide, with simple flanks and rounded humeri. Each elytron suboblong, with two perforate, nude basal foveae, the sutural fovea at origin of an entire sutural stria which is slightly everted apically, the discal fovea at origin of a deep, glabrous impression.

Abdomen longer than elytra, with subparallel sides and wide margins for first three segments, then gradually tapering to a rounded apex. Five visible tergites in a median length ratio of 4/3/2.5/4/3 with the last vertical and invisible from above. Six visible sternites in a median

length ratio of 2/3.6/2.3/1/1.4/1.5 with the first triangular between the metathoracic coxae ; second largest, as usual, with a median subcircular impression, and laterally near each margin a subtriangular impression ; sixth with its apical margin medianly incised as in males of *Tyrus*, *Neotyrus*, *Tyrogatunus*, *Cedius* and other tyrine genera, this incisure containing a minute penial plate when the aedeagus is not exserted.

Metasternum medianly gibbous on either side of a posteriorly developed, subtriangular impression ; posterior margin medianly incised to contain the acute base of the first sternite. Laterally, near the ventral margin of each elytron, there is a narrow, longitudinal sulcus from the posterior third of mesosternum to near center of metasternal length. This *lateral sternal sulcus* may mark the position of the episternal-sternal suture of less specialized tyrines, e.g. *Tmesiphorus*. Sternal foveae absent as such. This very uncommon condition attests the high specialization of *araujoi*. Thus foveae I, II, V and VI are absent, and only vague traces remain of foveae III and the very resistant IV.

Legs macroscelie. Anterior legs abnormal (P1. I, 2), the trochanters with a prominent spine from ventral face ; femora with a weakly formed cusp at basal fifth of ventral face ; tibiae with distal two-fifths of ventral face emarginate and hirsute ; three-segmented tarsi of usual proportions, and bearing a pair of long, equal, arcuate claws. Other legs simple.

Described on one male, the type, deposited in the author's collection. Collected by R. L. Araujo and M. C. Leite near São Paulo, S. P., Brazil (No. 2555), October 26, 1944, in the nest of the termite, *Armitermes festivellus* Silvestri. The termite host was identified by Professor Alfred Emerson of the University of Chicago.

This interesting species, named in honor of Mr. Araujo, is not too satisfactorily placed in the genus *Hamotocellus*. This genus and the genotype, *hirsutus*, were described by Raffray (1911, p. 444-445), and later keyed into the Tyrini by Park (1942, p. 333). In the description of *hirsutus* no mention is made of its ecology, and its type locality is given as São Paulo, Brazil.

*Hamotocellus* must be amended to contain *araujoi*, since the original description states that the antebasal pronotal sulcus is strongly developed and terminates on each side in a lateral fovea (as in the subgenus *Hamotooides* of *Hamotus*), while the elytra lack all striae and basal foveae. These are but two of a number of discrepancies.

On the other hand, the truncate front and total absence of a median antennal tubercle are rare in Tyrini. Only two tyrine genera have this structure, namely, *Hamotocellus* of Brazil and *Ryxabis* of Singapore.

Further information may necessitate a new genus or new subgenus for *aranjoi*, but for the present it seems best to amend *Hamotocellus* to contain tyrini having (1) large maxillary palpi having the fourth (distal) segment entirely sulcate on the mesial face, (2) median antennal tubercle absent, the antennae being placed at either angle of the truncate front, and (3) tarsi each with a pair of long, equal claws. This combination will contain *hirsutus* and *aranjoi*, but will exclude other tyrine pselaphids known at present.

These two species may be readily separated on a number of characters. *Hamotocellus hirsutus* Raffray is not known from the nests of termites. It is materially larger, being four millimeters long. The setae on the pronotum and along the elytral margins are shorter and slightly clubbed or capitulate. The head is as wide between antennae as between eyes. Pronotum with an entire, strong antebasal sulcus connecting the lateral foveae. Elytra without striae or basal foveae; each elytron strongly subtriangular, so that the elytral apical margin meets the very broad first tergite to give these two areas a strong oval outline. Abdomen as long as elytra, with broad base and rapidly narrowing apex. Anterior legs with both the trochanter and base of femur strongly produced or spined; the tibia arcuate, regularly wider to apex and ventrally canaliculated.

*H. aranjoi* is a highly specialized pselaphid. This is demonstrated by the absence of sternal foveae. Its specializations do not include those features usually associated with the true guest, or symphile, of ants and termites (Park, 1942). In the absence of observational or experimental data concerning its ecological position in the termite society, it is suggested that *aranjoi* is a tolerated inmate, or synoekete, of *Armitermes festivellus*. In this role it may be a symphiloid obligate, or a facultative neutral. Here direct information is necessary.

This lack of ecological information applies to the more general problem of the role of Pselaphidae in the complex societies of ants and termites. With regard to termites as hosts, the following table is of interest.

From this table it will be seen that eleven species of neotropical Pselaphidae, from four widely separated localities, are known from seven different termite hosts. The pselaphids represent six tribes and nine genera. There are two points worth noting in the present state of our ignorance. One tribe of Pselaphidae, the Tyrini, contains three genera (*Neotyrus*, *Tyrogatunus*, *Hamotocellus*) and four species, or nearly 50 per cent, of those known to be associated with termites. Second, of the seven termite hosts, one species, *Coptotermes niger* Snyder, is host to four species of pselaphids, or nearly 50 per cent.

Neotropical Termiticolous Pselaphidae

Pselaphid	Locality	Host
<i>Phthegnomyus</i>		
<i>inermis</i> Wasmann	Venezuela	<i>Eutermes meinerti</i> Wasmann
<i>naso</i> Wasmann	Venezuela	<i>Eutermes meinerti</i> Wasmann
<i>Xybarida</i>		
<i>nasicola</i> Park	Panama Canal Zone	<i>Nasutitermes ephratae</i> (Holmgren)
<i>Oxarthrius</i>		
<i>escharus</i> Park	Panama Canal Zone	<i>Coptotermes niger</i> (Snyder)
<i>Dalmonexus</i>		
<i>seeversi</i> Park	Panama Canal Zone	<i>Cornitermes (C.) acignathus</i> <i>w alkeri</i> Snyder
<i>Anoplobraxis</i>		
<i>g uianensis</i> Park	Kartabo, British Guiana	<i>Anoplotermes (A.)</i> species
<i>Barrometopia</i>		
<i>quasimoda</i> Park	Panama Canal Zone	<i>Termites panamaensis</i> (Snyder)
<i>Neotyrus</i>		
<i>c optocolus</i> Park	Panama Canal Zone	<i>Coptotermes niger</i> Snyder
<i>harem</i> Park	Panama Canal Zone	<i>Coptotermes niger</i> Snyder
<i>Tyrogatunus</i>		
<i>zeteki</i> Park	Panama Canal Zone	<i>Coptotermes niger</i> Snyder
<i>Hamotocellus</i>		
<i>araujoi</i> Park	Sao Paulo, Brazil	<i>Armitermes festivellus</i> Silvestri

Thus there is an apparent neotropical emphasis upon the Tyrini as invaders of the termite society, and upon Coptotermes as the most stimulating host to pselaphids.

These views are insufficiently supported by additional records to be more than ideas at present. For example, there are now known 964 species of neotropical pselaphids. Of these but 11 species, or about 1.09 per cent, are known to inhabit termite nests.

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PLATE I

*Hamotocellus araujoi* new species

1. Dorsal aspect. Left side with pubescence not shown, and depressed areas stippled.
2. Prothoracic leg, posterior aspect. Drawn to same scale as the first figure.
3. Maxillary palpus, lateroventral aspect.
4. Fourth (distal) segment of maxillary palpus, mesiodorsal aspect. This and the third figure at the same magnification as the first two figures but drawn to a larger scale.

## PLATE I

